M/053/005

Tenneco Minerals
A Tenneco Company

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April 11, 1990

Mr. Don Ostler, Director
Utah Bureau of Water Pollution Control
288 North 1460 West
P.O. Box 16690
Salt Lake City, UT 84116-0690

Reference: Response to Your Letter of April 5, 1990

Dear Mr. Ostler:

In response to your letter April 5, 1990 I perceive that there is some misunderstanding as to the events that occurred on March 9, 1990 (re: second solution breach).

Also, in response to your request we are forwarding copies of detailed events of the heap breach, remedies we have implimented and answers to your concerns.

The discussion of events is attached to this letter. Please advise me of any concerns you may have.

Sincerely,

TENNECO MINERALS COMPANY

Ken A. Kluksdahl
Mine Manager

KAK:bas

Attachments:

cc: D. W. Hedberg
W. Thomas

CHRONOLOGY OF EVENTS

1) February 16, 1990: Mining contractor concludes loading of ore onto leach pad #1, cell 7. Final ore is stacked onto pad access ramp (Figure 1).

2) February 18, 1990: TMC personnel conclude piping installation on leach pad #1, cell 7. Entire cell is under irrigation (Figure 2).

3) February 21, 1990: (Figure 3) 4:30 p.m. solution breach occurs on leach pad #1, cell 7. 8000 gallons of barren solution pours through a six-inch pipe end cap which is blown off due to a faulty pipe clamp. The solutions penetrate the heap and contact the conveyor belt access ramp. The ramp is not ripped and bermed, consequently, the solutions travel horizontally and effuse the heap along the south heap face. Solutions then travel across the exposed frozen access ramp to a belt underpass. The system is shutdown by 4:39 p.m. Neutralization is put into effect with 8 lbs of calcium hypochlorite. The contained solutions are scooped up and placed onto the leach pad. The "mudded" areas are mixed with mine waste and removed to the leach pad. The ramp area is ripped and bermed to prevent future occurrances (Figure 4). Leaching resumes upon pipe repair.

4) February 22, 1990: Formal notification is given to the Utah Bureau of Water Pollution Control and Division of Oil, Gas, and Mining (in-person). Phone calls cannot be made to the Dixie Resource Area BLM office or Southwest District Health Department due to inoperable phones at the mine. Letters are written to confirm the event and W. Thomas (Southwest District Health Department) is contacted on February 25, 1990.

5) February 27, 1990: Formal notification from the Utah Division of Oil, Gas and Mining is received regarding the solution breach. Actions are deemed appropriate.

6) March 5, 1990: Formal notification from the Utah Bureau of Water Pollution Control is received regarding the solution breach. Actions are deemed appropriate.

7) March 9, 1990: (Figure 5) 4:35 p.m. second solution breach is observed on leach pad #1, cell 7. Approximately 300 gallons of cyanide solution is observed to have worked beyond the ripped and bermed portion of the old conveyor access ramp. The solutions are trapped from further movement by a second clay berm. The solutions are analyzed and determined to be process solution. Neutralization is immediately placed into effect. Approximately .8lbs of calcium hypochlorite is added to the solutions. Cell 7 end pipe is removed from leaching (Figure 6). Notification is made to the Utah Bureau of Water Pollution Control, Utah Division of Oil, Gas, and Mining and Southwest District Health Department (BLM cannot be reached).

8) March 10, 1990: (Figure 6) site cleanup begins. Access ramp is entirely removed from the leach pad contact. The FML is exposed to contain solutions and not allow "bridging". Preliminary soil samples are taken during clean-up. Site laboratory confirms 12.5 ppm cyanide. An additional 1/4 lb of calcium hypochlorite is added and an additional 1 foot of surface material is removed. Additional soil tests indicate no cyanide detected.

9) March 12, 1990: Formal notification is sent to the Utah Bureau of Water Pollution Control, Division of Oil, Gas and Mining, Dixie Resource Area BLM office and Southwest District Health Department. (Phone conversation is also made to the BLM office).

RESPONSES TO APRIL 5, 1990 LETTER

These two events would not have happened had we and our mining contractor followed standard operating procedure which is to cross-rip ALL access ramps onto the leach pads. Unfortunately, two tasks were missed upon completing cell 7. First, over the pad area proper, we failed to cross-rip the conveyor access ramp. Thus, due to the densification of the material while running equipment over the ramp, we created a solution pathway which would encourage horizontal solution movement. This area subsequently was covered with crushed ore and leach piping was placed on top (see Figure 2). Second, in the berm "bridge" area (ground to pad interface), we failed to cross-rip and berm the access ramp. Upon freezing and wet weather, this further "sealed" the ramp and created a pathway beyond containment.

Our first response should have corrected the problem of containment. However, we now recognize that solutions were still capable of reaching the ripped and bermed segment rather than flowing vertically (due to our inability to affect the ore-covered ramp). Additive to this was the events themselves. The end cap rupture created a sizeable amount of solution in a relatively small area. This ultimately led to heap channeling when the solutions reached the covered access ramp. Solutions then "surfaced" on the heap side exposure. This channeling happened again when cell 7 was started up ultimately causing the second breach.

Our second response completely eliminated the access ramp, hence no breach beyond containment can occur. Secondly, we completely removed the "channeled" area from surface leach. We have not seen any evidence of solutions effusing the side of the heap since. In the future we will: (Figure 7).

a) Rip all traffic areas on the leach pad;

b) Place 1 1/2" gravel across the FML and "bridge" the ground surface to the contained material (6-12" thick);

c) Second, we will place a geotextile fabric over the gravel bed;

d) Third, we will build an access ramp across the constructed bridge;

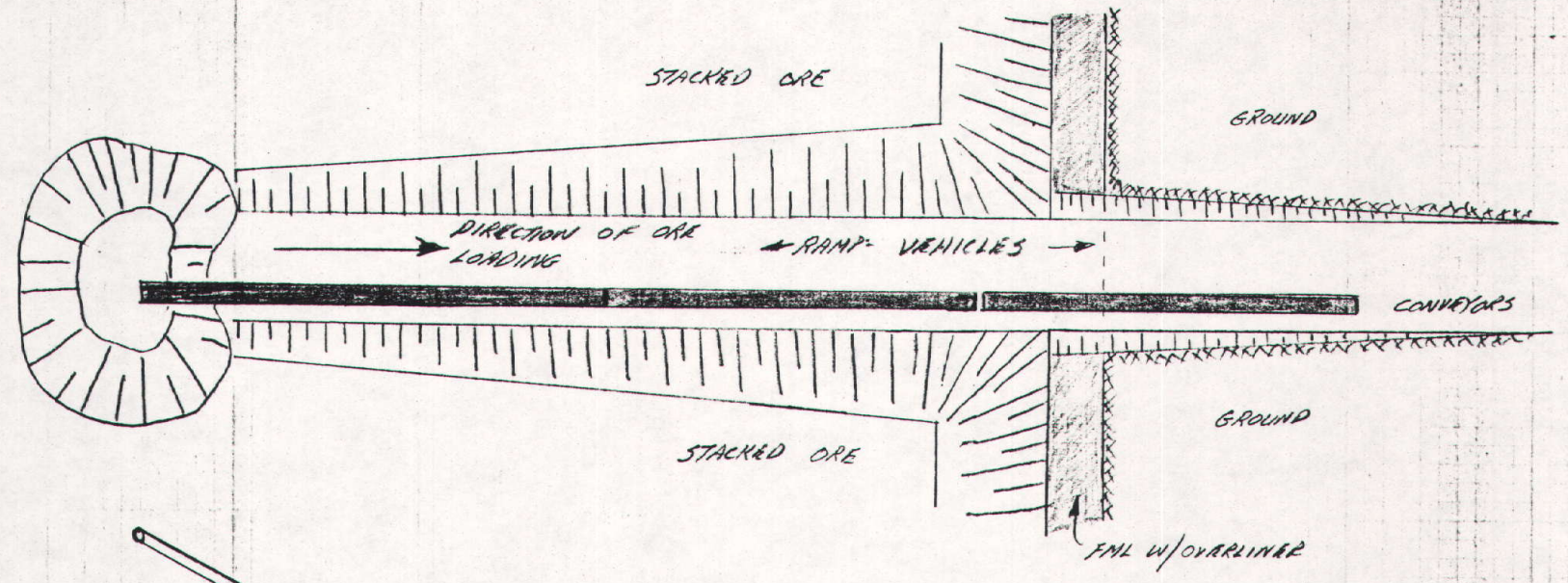
e) Upon completion of the placing of ore, the ramp will be excavated by backhoe to the geotextile.

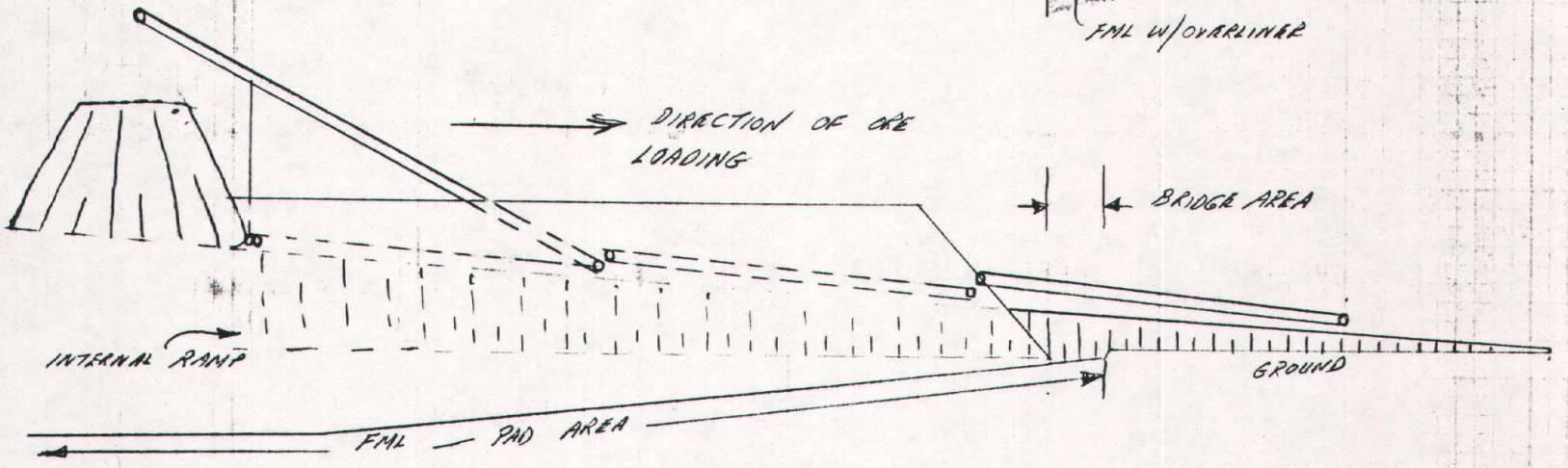
f) If necessary, the remaining gravel will be hand shoveled to the FML liner.

We disagree with the Bureau that solutions are being heavily applied to the side slopes. In fact, we are now using sprinklers because we have found a more uniform distribution and coverage is being achieved versus drip systems. Drip systems from our history placed uneven solution amounts across the heap side slopes and actually increased channeling.

As I discussed with Lyle Stott, the pressure distribution system of our heap lines operates in the range of 50 psi at the cell valves to 1-2 psi at the pipe ends. At the barrens pumps, an operating pressure of 200-300 psi is maintained. It is impractical to install a pressure sensing device on the barrens pumps given these operating characteristics. We are exploring pressure sensing devices to be located at the cell valves.

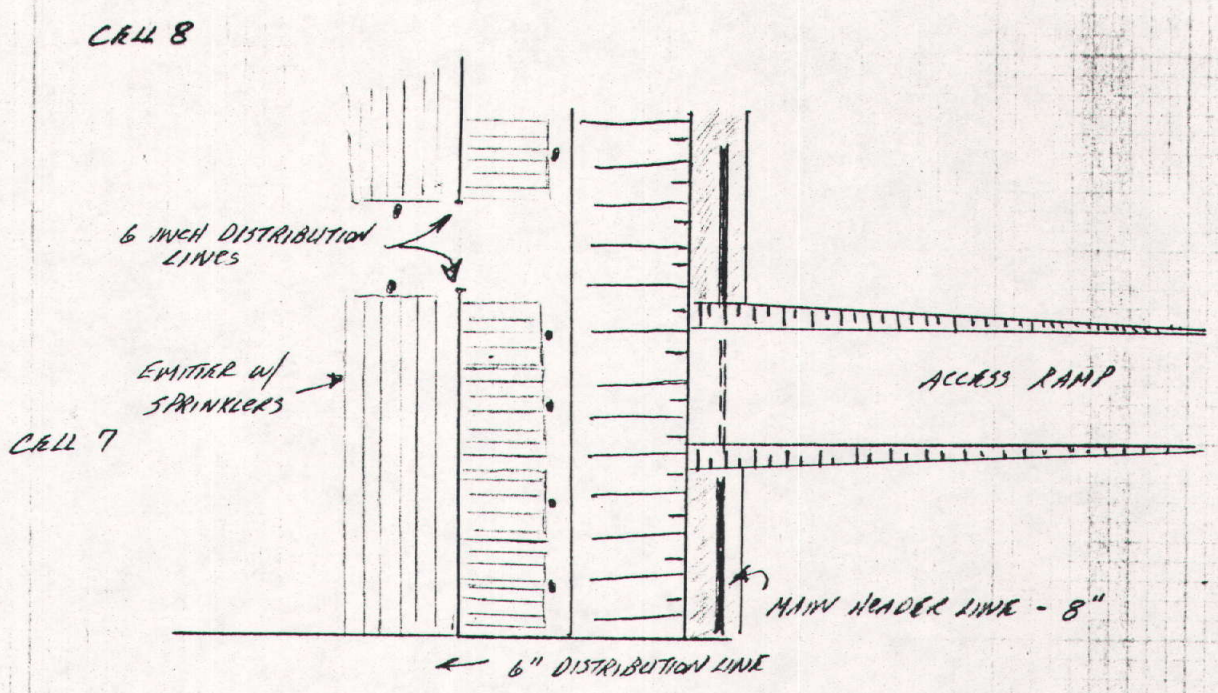
PLAN VIEW CELL 7 ACCESS RAMP



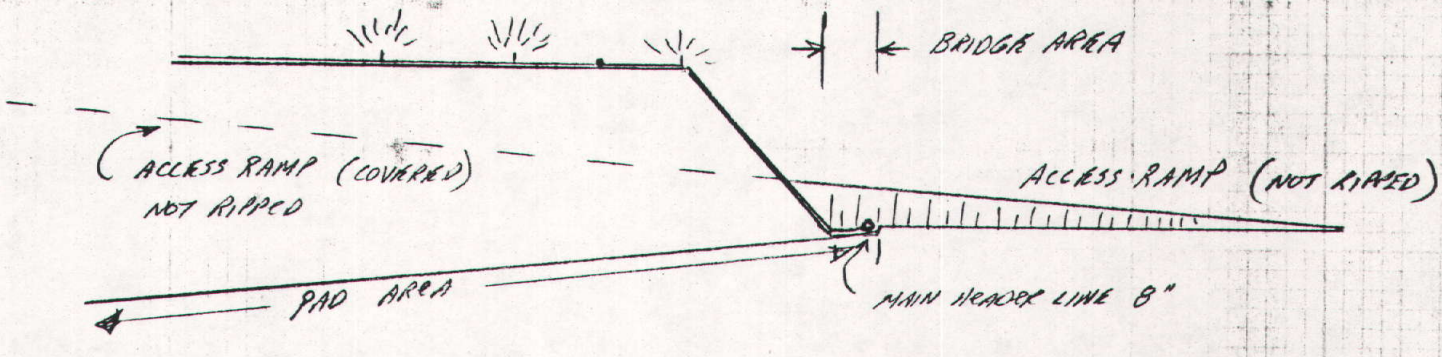


SECTION CELL 7 ACCESS RAMP

FIGURE 1. LEACH PAD 1 - CELL 7
FINAL LOADING

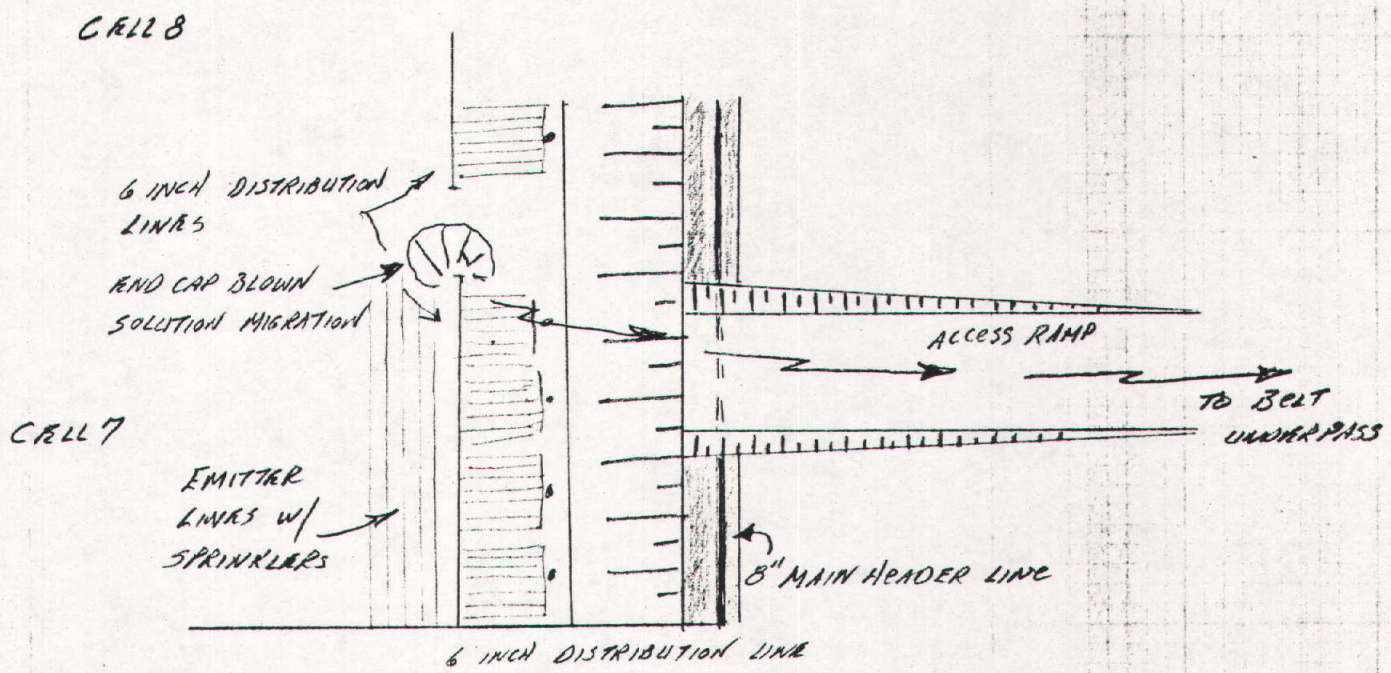


PLAN VIEW - PIPING ARRANGEMENT

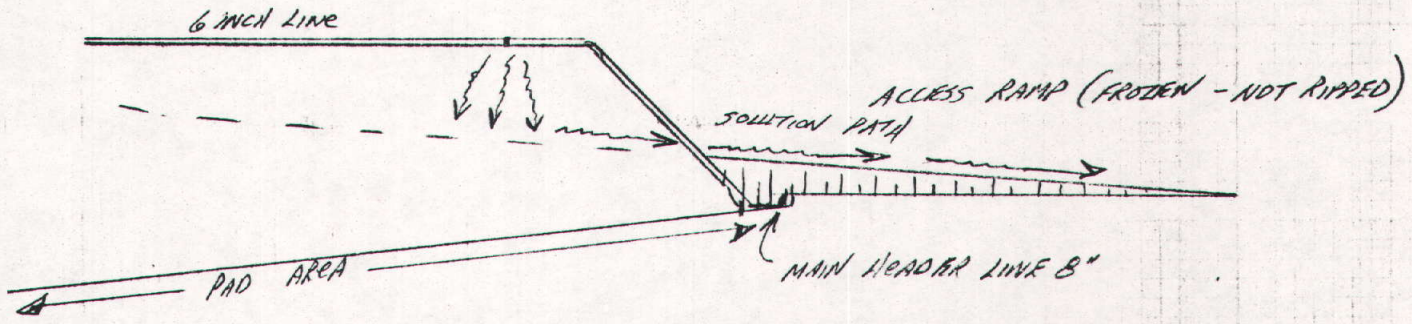


SECTION CELL 7 PIPING ARRANGEMENT

FIGURE 2. LEACH PAD 1 - CELL 7
PIPING ARRANGEMENT

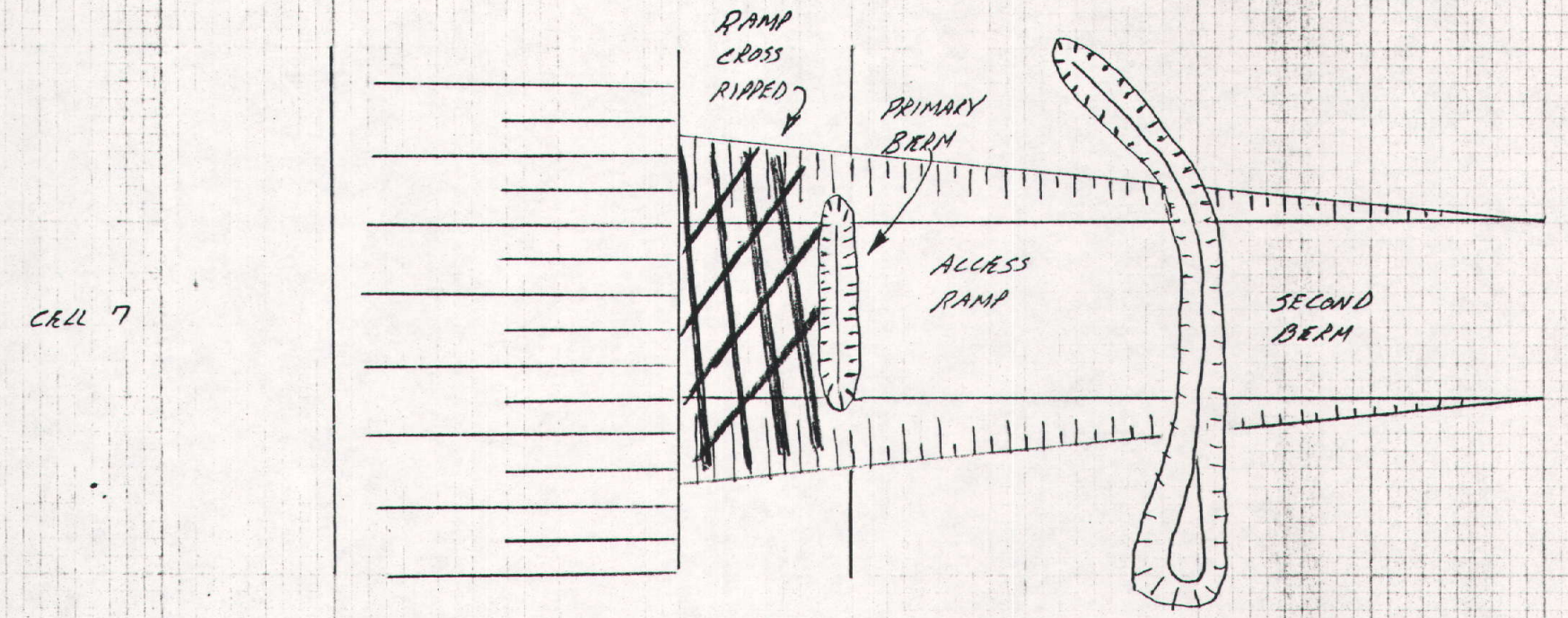


PLAN VIEW - SOLUTION BREACH - FLOW PATH

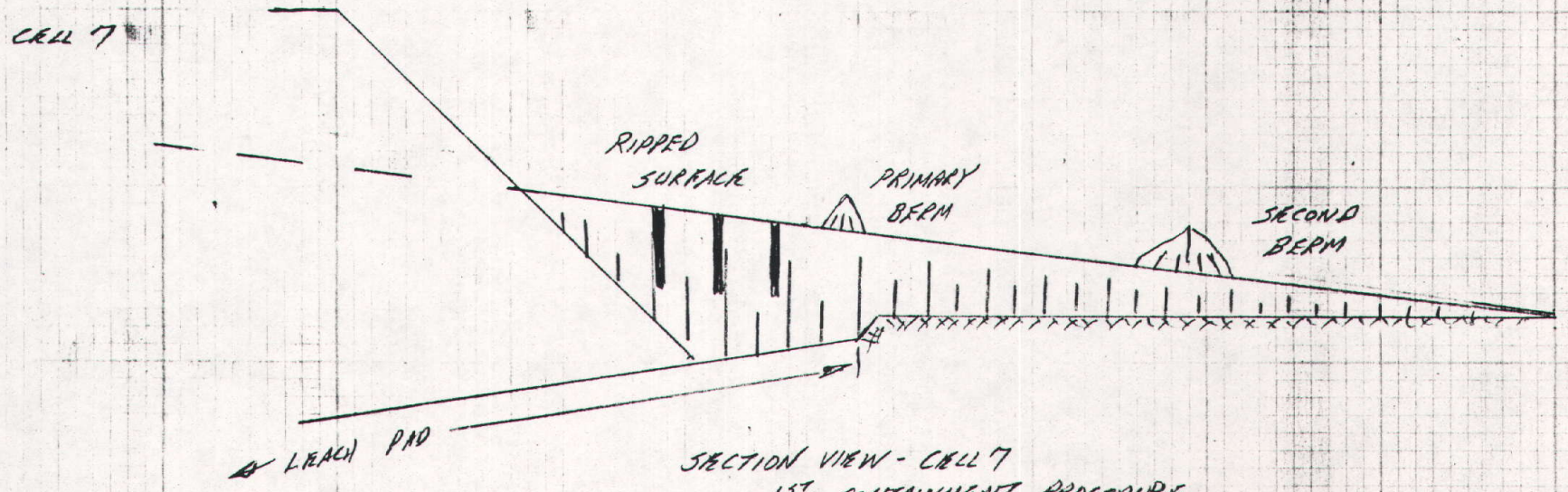


SECTION CELL 7 - SOLUTION BREACH PATH

FIGURE 3. LEACH PAD 1 - CELL 7
1ST SOLUTION BREACH PATH

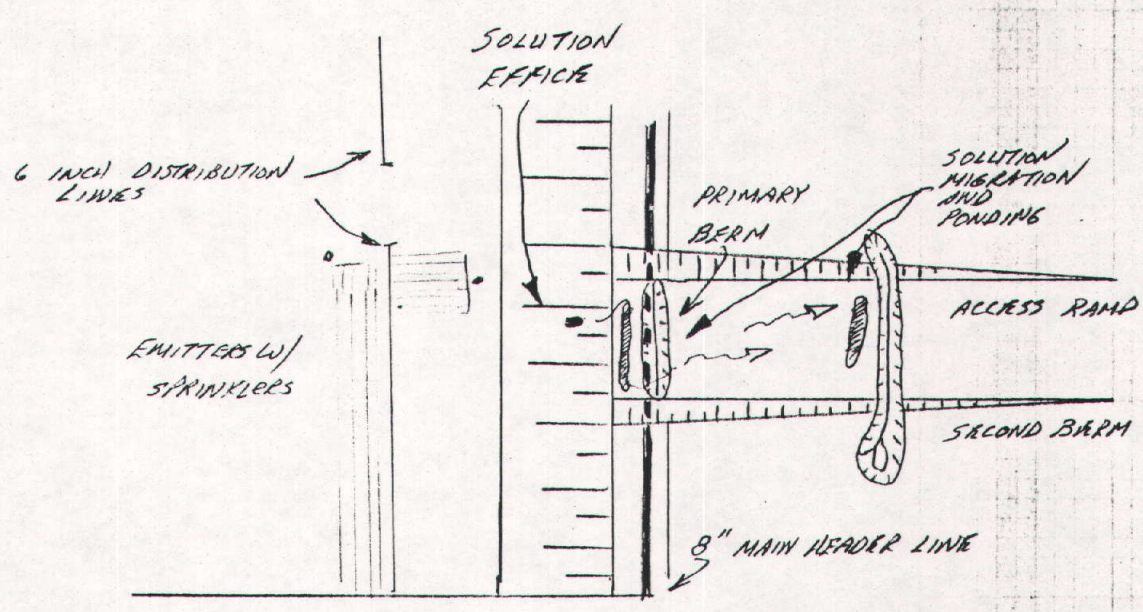


PLAN VIEW - CELL 7
1ST CONTAINMENT PROCEDURE

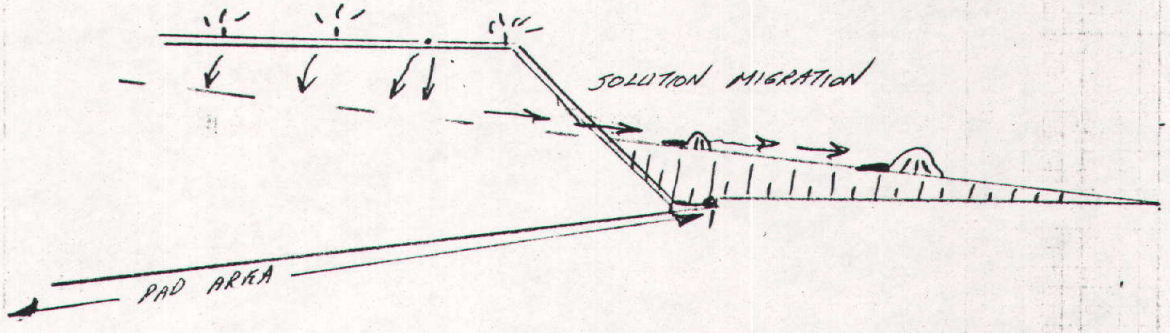


SECTION VIEW - CELL 7
1ST CONTAINMENT PROCEDURE

FIGURE 4. LEACH PAD 1 - CELL 7



PLAN VIEW - SECOND BREACH SOLUTION FLOW



SECTION VIEW - SECOND BREACH SOLUTION FLOW

FIGURE 5. LEACH PAD 1 - CELL 7
SECOND BREACH SOLUTION FLOW PATH

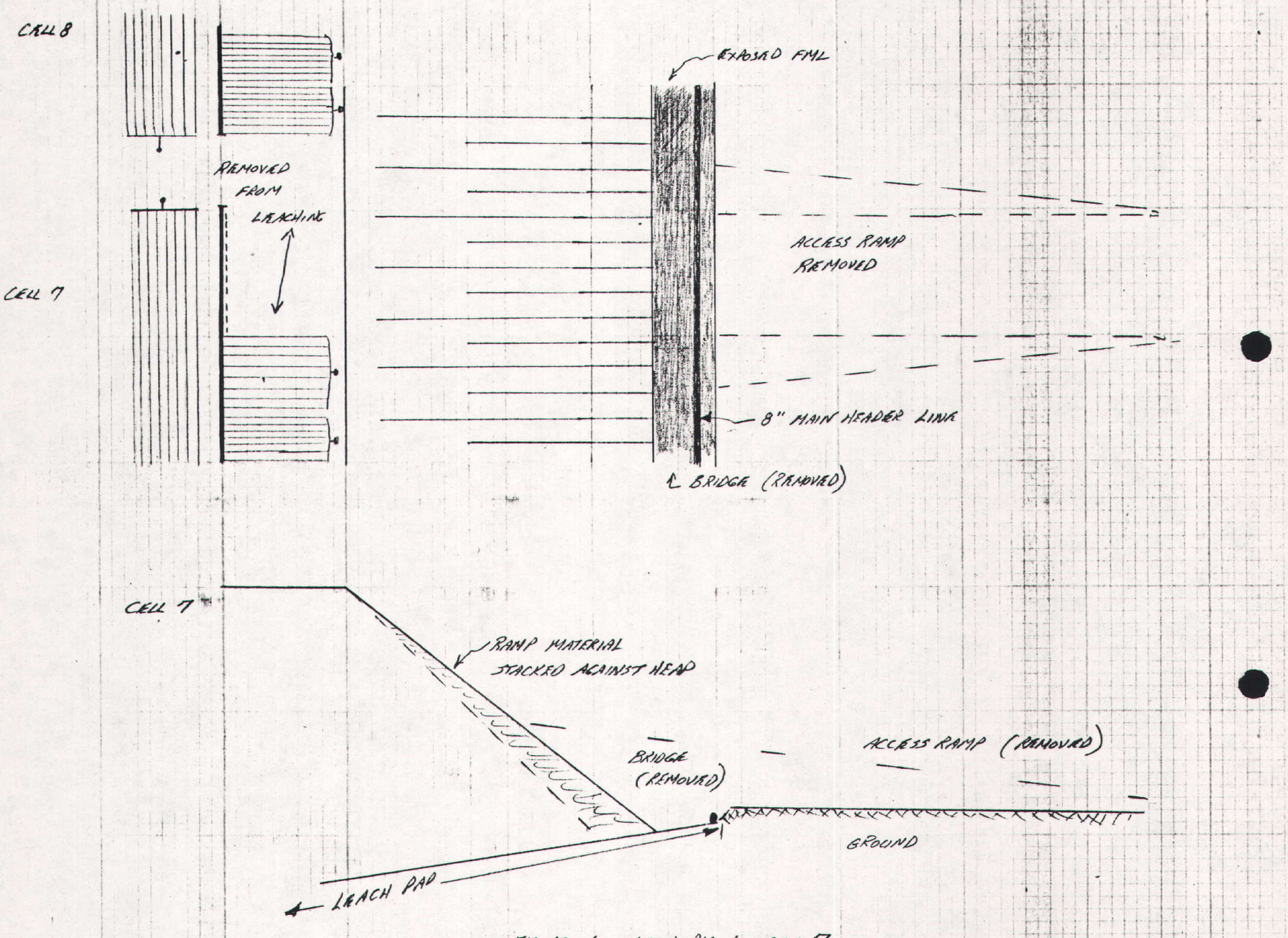


FIGURE 6. LEACH PAD 1 - CELL 7
REMEDIAL ACTIONS BRANCH 2

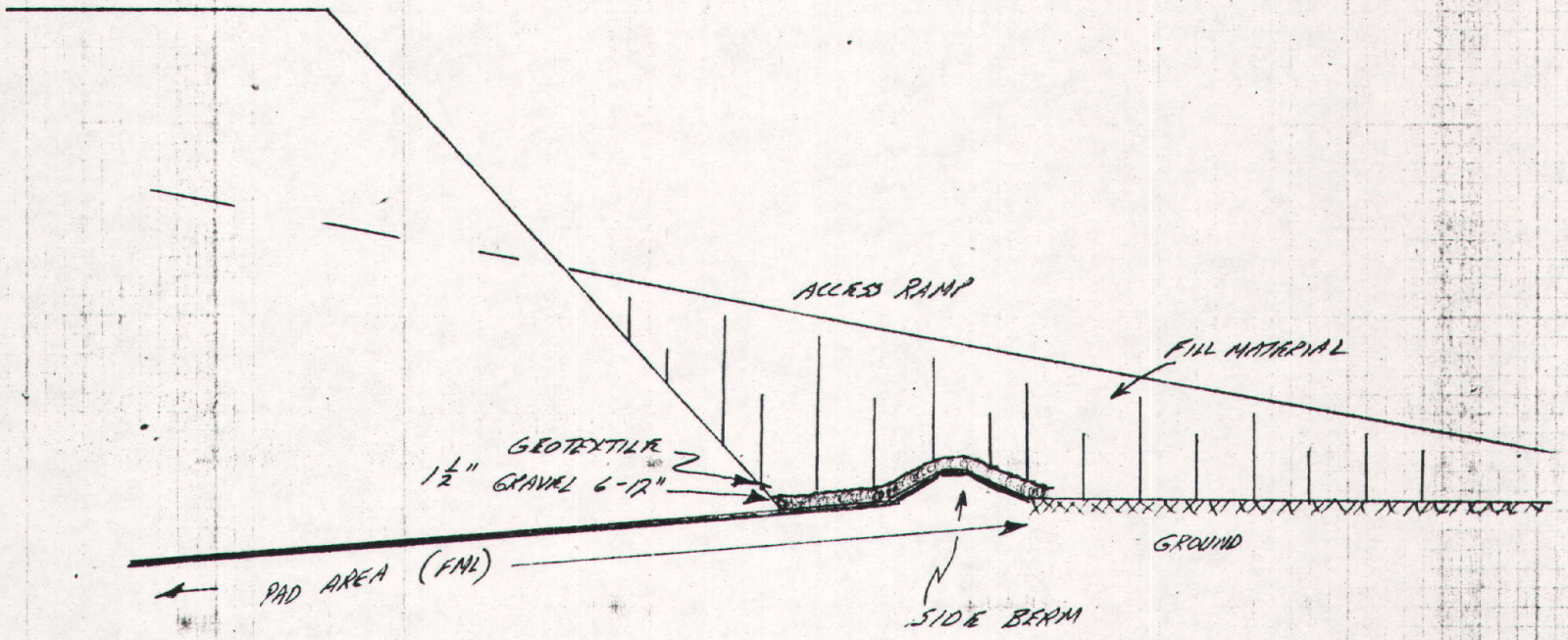


FIGURE 7. PROPOSED RAMP CONSTRUCTION